

CLAIMS

What is claimed:

1. An apparatus for deploying a bronchial isolation device in a bronchial passageway in a lung of a patient, comprising:
 - 5 an outer shaft having a distal end;
 - a housing coupled to the distal end of the outer shaft and configured to receive the bronchial device;
 - an inner shaft slidably disposed within the outer shaft; and
 - a handle adapted to move the outer shaft relative to both the inner shaft and
 - 10 the handle while the inner shaft remains fixed relative to the handle so as to eject the bronchial isolation device from the housing.
2. The apparatus of claim 1, further comprising a flange coupled to a distal region of the inner shaft and movably disposed in the housing, wherein the
- 15 flange is adapted to eject the bronchial isolation device from the housing during proximal movement of the outer shaft.
3. The apparatus of claim 2, wherein the housing has limited range of travel relative to the flange such that the flange does not move substantially outside
- 20 of the housing.
4. The apparatus of claim 1, further comprising an actuation member coupled to the handle, wherein movement of the actuation member causes the outer shaft to move relative to the inner shaft and the handle.

5. The apparatus of claim 4, further comprising a rack and pinion system that couples movement of the actuation member to movement of the outer shaft.

5 6. The apparatus of claim 4, wherein the outer shaft moves at a different rate than the actuation member.

7. The apparatus of claim 6, wherein the outer shaft moves about half the distance that the actuation member moves.

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8. The apparatus of claim 4, wherein the outer shaft moves in a proximal direction when the actuation member is moved in a distal direction, and wherein the outer shaft moves in a distal direction when the actuation member is moved in a proximal direction.

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9. The apparatus of claim 4, wherein the actuation member must be out of an initial position in order to eject the bronchial isolation device from the housing, and further comprising a safety lock that retains the actuation member in the initial position.

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10. The apparatus of claim 9, wherein the safety lock employs magnets to retain the actuation member in the initial position.

11. The apparatus of claim 1, further comprising a sheath disposed over a portion of the outer shaft such that the outer shaft is slidably disposed within the sheath, the sheath having a proximal end attached to the handle.

5 12. The apparatus of claim 11, wherein the sheath comprises a lubricous material.

13. The apparatus of claim 1, wherein a portion of the outer shaft slides into the handle when the outer shaft moves in a proximal direction.

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14. The apparatus of claim 1, further comprising an extension disposed on the housing, wherein the extension defines a length substantially equal to a largest possible diameter for a bronchial passageway in which the bronchial isolation device can be used.

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15. The apparatus of claim 1, further comprising an extension disposed on the housing, wherein the extension defines a length substantially equal to a smallest possible diameter for a bronchial passageway in which the bronchial isolation device can be used.

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16. The apparatus of claim 1, wherein the outer shaft is configured to be placed through a working channel of a bronchoscope.

17. The apparatus of claim 16, further comprising a mechanism for adjustably positioning the housing relative to the working channel.

18. An apparatus for deploying a bronchial isolation device in a bronchial passageway in a lung of a patient, comprising:

an outer shaft having a distal end;

a housing coupled to the distal end of the outer shaft and configured to receive the bronchial device;

an ejection member movably disposed in the housing; and

a handle adapted to cause relative movement between the housing and the ejection member so as to eject the bronchial isolation device from the housing, wherein relative movement between the housing and the ejection member is limited to prevent the ejection member from moving substantially outside of the housing.

19. The apparatus of claim 18, further comprising an inner shaft slidably disposed within the outer shaft, wherein the ejection member is coupled to a distal region of the inner shaft.

20. The apparatus of claim 19, wherein the outer shaft is configured to move relative to the inner shaft and the handle, while the inner shaft remains fixed relative to the handle.

21. The apparatus of claim 18, wherein the relative movement between the housing and the ejection member is effected by moving the outer shaft relative to the ejection member.

5 22. The apparatus of claim 18, wherein the ejection member is completely prevented from moving outside of the housing

23. An apparatus for delivering a device into a body passageway, comprising:

10 a handle;

an outer shaft movably coupled to the handle;

an inner shaft slidably disposed within the outer shaft and fixedly coupled to the handle, the handle adapted to move the outer shaft relative to both the inner shaft and the handle while the inner shaft remains fixed relative to the handle; and

15 a sheath attached to the handle and disposed over a portion of the outer shaft such that the outer shaft is free to slide within the sheath.

24. The apparatus of claim 23, wherein the sheath comprises a lubricous material.

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25. The apparatus of claim 23, wherein the sheath comprises polyimide, Teflon doped polyimide, or polyetheretherketone.

26. The apparatus of claim 23, further comprising a housing coupled to the distal end of the outer shaft and configured to receive the bronchial device.

27. The apparatus of claim 23, wherein the apparatus is adapted for use in
5 a bronchial passageway.

28. A method of deploying a bronchial device in a bronchial passageway in a patient's lung, the method comprising:

providing a delivery device having an outer shaft, an inner shaft and a handle;
10 coupling the bronchial isolation device to a housing on a distal end of the outer shaft and a inner shaft;

advancing the delivery catheter into the patient's lung with the housing carrying the bronchial device until the housing is positioned in the bronchial passageway; and

15 moving the outer shaft in a proximal direction relative to the inner shaft and the handle while the inner shaft remains fixed relative to the handle to release the bronchial isolation device from the housing.

29. The method of claim 28, further comprising positioning the delivery
20 catheter at least partially through a working channel of a bronchoscope, wherein advancing the delivery catheter into the patient's lung comprises advancing the bronchoscope into the patient's lung while the delivery catheter is at least partially positioned in the working channel.

30. The method of claim 28, further comprising positioning a bronchoscope in the patient's lung, wherein the delivery catheter is advanced into the patient's lung through the bronchoscope.

5 31. A method of deploying a bronchial device in a bronchial passageway in a patient's lung, the method comprising:

providing a delivery device having an outer shaft, a housing coupled to a distal end of the outer shaft, and an ejection member movably disposed in the housing;

10 advancing the delivery catheter into the patient's lung with the housing carrying the bronchial device until the housing is positioned in the bronchial passageway; and

moving the ejection member relative to the housing to eject the bronchial isolation device from the housing, wherein the ejection member is substantially
15 limited from moving outside of the housing.

32. The method of claim 31, wherein the ejection member is completely prevented from moving outside of the housing.

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